

**CHAPTER 3.2**  
**WASTE GRADING AND SUBGRADE PREPARATION**

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3.2-1. GENERAL. The purpose of the subgrade for landfill liners and covers is to provide a firm foundation and to establish slopes for drainage. When landfill covers are constructed over hazardous waste sites, waste regrading is commonly performed to flatten slopes and minimize the amount of borrow that needs to be brought on-site. When landfill liners are constructed, waste must be carefully placed so the liner system is not damaged. Regraded waste and waste placed in landfill liners usually must be compacted to minimize the amount of settlement which occurs.

a. Preconstruction Submittals. The contractor should provide preconstruction submittals as required by the specifications. The following is a list of typical submittal requirements.

A waste regrading plan which describes how waste will be regraded and procedures which will be followed if buried drums or other hazardous materials are discovered during regrading. Hazardous materials anticipated to be encountered should be addressed in the SSHP.

b. Daily Reports. Daily reports should indicate when unexpected drums or other potentially hazardous materials are encountered during construction.

c. Manifests. Manifesting and disposal records must be submitted for any hazardous materials which are disposed of off site. Engineering Pamphlet 200-1-2 - Process and Procedures for RCRA Manifesting provides guidance on the procedures and responsibilities associated with manifesting hazardous waste under RCRA and Department of Transportation regulations.

3.2-2. EXECUTION.

a. Clearing and Grubbing. Clearing of vegetation is performed on the surface of old landfills prior to placement of a landfill cover. However, grubbing is generally not performed to minimize disturbance of the waste.

(1) Limits of clearing and grubbing should be clearly established prior to construction.

(2) Ensure the specifications clearly define which materials generated from clearing, grubbing, and tree removal are contaminated and which materials are not contaminated.

(3) Ensure the contractor stockpiles contaminated cleared and grubbed material in a location which is separated from uncontaminated material.

(4) Ensure the contractor is disposing of both contaminated and non-contaminated cleared and grubbed material in accordance with the specifications.

(5) Ensure stockpiles containing contaminated material are lined and/or covered at all times in accordance with the plans and specifications. Contact the designer if the plans and specifications do not discuss requirements for stockpile liners and/or covers.

b. Waste Grading.

(1) Verify waste material is placed so that large void spaces do not exist.

(2) Do not allow large pieces of debris (greater than 300 mm (12 inches) in diameter) to be placed in the upper .6 meters (2 feet) of fill. Large debris should be well dispersed in lower portions of the waste fill.

(3) Over excavation may be required to remove large objects present at the surface of regraded waste.

(4) Ensure that regraded waste is placed in lifts and compacted with a landfill compactor as described in the specifications. Periodically check that the lift thickness used by the contractor does not exceed specified requirements.

(5) Halt construction in the area and notify the designers if unexpected hazardous materials (barrels, tanks, medical waste, UXO, etc...) are discovered during waste regrading.

(6) Ensure the contractor minimizes the amount of waste exposed during regrading operations to reduce odor problems.

(7) Air quality monitoring equipment should be closely monitored during waste regrading. Daily cover may need to be placed over areas of exposed waste at the end of each days operations if odor or volatilization of contaminants becomes a problem.

(8) Daily cover normally consists of a minimum of 6 inches of soil. However, foams and geosynthetics have been used as daily cover on some projects.

(9) When regrading waste prior to placement of a landfill cover, look for leachate seeps that present unsuitable conditions for fill placement. These seeps should be reported to the designer.

(10) Verify the final lines and grades of the regraded waste are correct.

c. Compaction of Waste. Compaction of waste is important in preventing damage to the landfill cover due to differential settlement.

(1) Waste compaction equipment typically weighs 18,000 to 32,000 kg (40,000 to 70,000 pounds). Check the specifications for equipment weight or compaction pressure requirements.

(2) Compaction of waste is usually specified by requiring several passes of a compactor over all areas of the waste instead of requiring that a specific density criteria be achieved. The number of passes required is site specific and should be addressed in the specifications. Spot-check to make sure the contractor is making the minimum required number of passes for each lift of waste placed.

(3) For landfill liners, verify the contractor's method of

placement does not damage the liner system.

(4) Compaction equipment should be operated so that the compactor overlaps the rolled adjacent strip by not less than 0.3 meters (12 inches).

(5) Check for areas where additional fill needs to be placed due to settlement.

d. Subgrade. Subgrade is the term commonly used to describe the soils placed immediately beneath the landfill cover or liner. This layer provides a foundation layer for the landfill cover or liner and is typically a minimum of 0.3 meters (12 inches) in thickness.

(1) Determine from the contract drawings whether on-site or off-site borrow will be used for the subgrade soil.

(2) If on-site borrow will be used, is there sufficient quantity?

(3) Verify the subgrade soils meet the specified requirements for soil type and gradation.

(4) Verify subgrade soils are placed to the lines and grades shown on the drawings and compacted and tested in accordance with the specifications.

(5) Compaction criteria are often waived for the first lift of the subgrade layer when it is placed on top of compressible waste because it is difficult to get adequate compaction.

(6) Inspect for erosion in the surface of the subgrade and require the contractor to reshape and regrade damaged areas.